

ABSTRACT OF THE DISCLOSURE

In a light diffuser, a strong light diffusion processing is performed to a lamp corresponding part located in a vertical immediate downward direction of each of a plurality of flash lamps, and a weak light diffusion processing is performed to an inter-lamp corresponding part located between lamp corresponding parts adjacent to each other. Thereby, the light transmittance of the lamp corresponding part is lower than that of the inter-lamp corresponding part. Light that is emitted from each of the flash lamps and directed to a vertical immediate downward direction is diffused intensely, while reducing the degree of light diffusion at a location immediately below space between the adjacent flash lamps, thereby improving in-plane uniformity of illumination distribution on a semiconductor wafer. This enables to provide a thermal processing apparatus capable of improving in-plane uniformity of illumination distribution on a substrate.